

BCS 04-5002-PCT_Erhöhte Akt. OK1_SEQUENZPROTOKOLL.ST25
SEQUENCE LISTING

<110> Bayer CropScience GmbH

<120> Plants with increased activity of a starch phosphorylating enzyme

<130> BCS 04-5002-PCT

<150> EP04090086.2

<151> 2004-03-05

<150> US60/549,945

<151> 2004-03-05

<150> US60/549,945 provisional

<151> 2004-03-05

<150> EP04090121.7

<151> 2004-03-29

<160> 5

<170> PatentIn version 3.1

<210> 1

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<212> DNA

<213> Arabidopsis thaliana

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Asp	His	Gln	Val	Asn	Phe	Gly	Asp	His	Val	Ala	Met	Phe	Gly	Ser	Ala		
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Lys	Glu	Ile	Gly	Ser	Trp	Lys	Lys	Lys	Ser	Pro	Leu	Asn	Trp	Ser	Glu		
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Val	Gly	Asn	Asp	Asp	Asp	Val	Gly	Asp	Gly	His	Glu	Arg	Asp	Asn			
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cat	gat	ggt	ggt	gat	gat	aga	gta	gtg	gga	agt	gaa	aat	ggt	gcg	cag		624
His	Asp	Val	Gly	Asp	Asp	Arg	Val	Val	Gly	Ser	Glu	Asn	Gly	Ala	Gln		
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Phe	Met	Arg	Ser	Asn	Asp	His	Gly	Asn	Arg	Glu	Val	Gly	Arg	Asn	Trp		
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Asp	Thr	Ser	Gly	Leu	Glu	Gly	Thr	Ala	Leu	Lys	Met	Val	Glu	Gly	Asp		
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cgc	aac	tct	aag	aac	tgg	tgg	aga	aag	ctt	gaa	atg	gta	cgc	gag	ggt		816
Arg	Asn	Ser	Lys	Asn	Trp	Trp	Arg	Lys	Leu	Glu	Met	Val	Arg	Glu	Val		
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tct Ser	gca Ala 290	att Ile	tat Tyr	ttg Leu	aag Lys	tgg Trp 295	ata Ile	aac Asn	aca Thr	ggt Gly	cag Gln 300	att Ile	cct Pro	tgt Cys	ttt Phe	912
gaa Glu 305	gat Asp	gga Gly	ggg Gly	cat His	cac His 310	cgt Arg	cca Pro	aac Asn	agg Arg	cat His 315	gcc Ala	gag Glu	att Ile	tcc Ser	aga Arg 320	960
ctt Leu	ata Ile	ttc Phe	cgt Arg	gag Glu 325	ttg Leu	gag Glu	cac His	att Ile	tgc Cys 330	agt Ser	aag Lys	aaa Lys	gat Asp	gct Ala 335	act Thr	1008
cca Pro	gag Glu	gaa Glu	gtg Val 340	ctt Leu	ggt Val	gct Ala	cgg Arg	aaa Lys 345	atc Ile	cat His	ccg Pro	tgt Cys	tta Leu 350	cct Pro	tct Ser	1056
ttc Phe	aaa Lys	gca Ala 355	gag Glu	ttt Phe	act Thr	gca Ala	gct Ala 360	gtc Val	cct Pro	cta Leu	act Thr	cgg Arg 365	att Ile	agg Arg	gac Asp	1104
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cat His 385	acg Thr	ata Ile	caa Gln	aat Asn	aag Lys 390	ctt Leu	cac His	cgg Arg	aat Asn	gct Ala 395	ggt Gly	cca Pro	gaa Glu	gat Asp	cta Leu 400	1200
att Ile	gca Ala	aca Thr	gaa Glu	gca Ala 405	atg Met	ctt Leu	caa Gln	cga Arg	att Ile 410	acc Thr	gag Glu	acc Thr	cca Pro	gga Gly 415	aaa Lys	1248
tat Tyr	agt Ser	gga Gly	gac Asp 420	ttt Phe	gtg Val	gag Glu	cag Gln	ttt Phe 425	aaa Lys	ata Ile	ttc Phe	cat His	aat Asn 430	gag Glu	ctt Leu	1296
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gaa Glu 465	tgt Cys	aaa Lys	aag Lys	cgc Arg	ctt Leu 470	gac Asp	aca Thr	tca Ser	gga Gly	gaa Glu 475	tca Ser	agc Ser	aat Asn	ggt Val	ttg Leu 480	1440
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tac Tyr 530	ttt Phe	ttt Phe	gtt Val	cta Leu	cta Leu	agc Ser 535	aga Arg	ttc Phe	ctc Leu	aat Asn	gct Ala 540	ctt Leu	gaa Glu	act Thr	atg Met	1632

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tca Ser	tgg Trp	aat Asn	gat Asp	cca Pro 565	cta Leu	gat Asp	gct Ala	ttg Leu	gtg Val 570	ttg Leu	ggt Gly	gtt Val	cac His	caa Gln 575	gta Val	1728
ggt Gly	cta Leu	tct Ser	ggt Gly 580	tgg Trp	aag Lys	caa Gln	gaa Glu	gaa Glu 585	tgt Cys	tta Leu	gcc Ala	att Ile	gga Gly 590	aat Asn	gaa Glu	1776
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gat Asp	gga Gly 610	aaa Lys	aca Thr	att Ile	tgg Trp	gcc Ala 615	atg Met	agg Arg	ctg Leu	aaa Lys	gca Ala 620	act Thr	ctt Leu	gat Asp	cga Arg	1872
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aca Thr 705	tta Leu	gtt Val	cag Gln	gtt Val	gag Glu 710	agc Ser	att Ile	gtt Val	ccg Pro	gga Gly 715	tca Ser	ttg Leu	cca Pro	gca Ala	act Thr 720	2160
tct Ser	ggt Gly	ggt Gly	cct Pro	att Ile 725	att Ile	ctc Leu	ttg Leu	gtc Val	aat Asn 730	aaa Lys	gct Ala	gat Asp	ggc Gly	gat Asp 735	gaa Glu	2208
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agt Ser	cca Pro 1070	gct Ala	gat Asp	ccg Pro	gac Asp	agt Ser 1075	aac Asn	ctt Leu	gtg Val	gaa Glu	gcc Ala 1080	gag Glu	atc Ile	gct Ala		3249

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Trp	Arg	Leu	Ala	Ser	Gly	Lys	Leu	Asp	Gly	Ile	Val	Gln	Thr	Leu	
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gct	ttc	gca	aac	ttc	agc	gaa	gag	ctt	ctt	gtg	tca	gga	aca	ggt	3384
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Arg Leu Thr Cys Thr Ala Thr Ser Ser Ser Thr Ile Glu Glu Gln Arg
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Lys Lys Lys Asp Gly Ser Gly Thr Lys Val Arg Leu Asn Val Arg Leu
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Asp His Gln Val Asn Phe Gly Asp His Val Ala Met Phe Gly Ser Ala
 85 90 95

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 Asn Gly Trp Val Cys Glu Leu Glu Leu Asp Gly Gly Gln Val Leu Glu
 115 120 125
 Tyr Lys Phe Val Ile Val Lys Asn Asp Gly Ser Leu Ser Trp Glu Ser
 130 135 140
 Gly Asp Asn Arg Val Leu Lys Val Pro Asn Ser Gly Asn Phe Ser Val
 145 150 155 160
 Val Cys His Trp Asp Ala Thr Arg Glu Thr Leu Asp Leu Pro Gln Glu
 165 170 175
 Val Gly Asn Asp Asp Asp Val Gly Asp Gly Gly His Glu Arg Asp Asn
 180 185 190
 His Asp Val Gly Asp Asp Arg Val Val Gly Ser Glu Asn Gly Ala Gln
 195 200 205
 Leu Gln Lys Ser Thr Leu Gly Gly Gln Trp Gln Gly Lys Asp Ala Ser
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 Phe Met Arg Ser Asn Asp His Gly Asn Arg Glu Val Gly Arg Asn Trp
 225 230 235 240
 Asp Thr Ser Gly Leu Glu Gly Thr Ala Leu Lys Met Val Glu Gly Asp
 245 250 255
 Arg Asn Ser Lys Asn Trp Trp Arg Lys Leu Glu Met Val Arg Glu Val
 260 265 270
 Ile Val Gly Ser Val Glu Arg Glu Glu Arg Leu Lys Ala Leu Ile Tyr
 275 280 285
 Ser Ala Ile Tyr Leu Lys Trp Ile Asn Thr Gly Gln Ile Pro Cys Phe
 290 295 300
 Glu Asp Gly Gly His His Arg Pro Asn Arg His Ala Glu Ile Ser Arg
 305 310 315 320
 Leu Ile Phe Arg Glu Leu Glu His Ile Cys Ser Lys Lys Asp Ala Thr
 325 330 335
 Pro Glu Glu Val Leu Val Ala Arg Lys Ile His Pro Cys Leu Pro Ser
 340 345 350
 Phe Lys Ala Glu Phe Thr Ala Ala Val Pro Leu Thr Arg Ile Arg Asp
 355 360 365

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Ile Ala His Arg Asn Asp Ile Pro His Asp Leu Lys Gln Glu Ile Lys
 370 375 380
 His Thr Ile Gln Asn Lys Leu His Arg Asn Ala Gly Pro Glu Asp Leu
 385 390 395 400
 Ile Ala Thr Glu Ala Met Leu Gln Arg Ile Thr Glu Thr Pro Gly Lys
 405 410 415
 Tyr Ser Gly Asp Phe Val Glu Gln Phe Lys Ile Phe His Asn Glu Leu
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 Lys Asp Phe Phe Asn Ala Gly Ser Leu Thr Glu Gln Leu Asp Ser Met
 435 440 445
 Lys Ile Ser Met Asp Asp Arg Gly Leu Ser Ala Leu Asn Leu Phe Phe
 450 455 460
 Glu Cys Lys Lys Arg Leu Asp Thr Ser Gly Glu Ser Ser Asn Val Leu
 465 470 475 480
 Glu Leu Ile Lys Thr Met His Ser Leu Ala Ser Leu Arg Glu Thr Ile
 485 490 495
 Ile Lys Glu Leu Asn Ser Gly Leu Arg Asn Asp Ala Pro Asp Thr Ala
 500 505 510
 Ile Ala Met Arg Gln Lys Trp Arg Leu Cys Glu Ile Gly Leu Glu Asp
 515 520 525
 Tyr Phe Phe Val Leu Leu Ser Arg Phe Leu Asn Ala Leu Glu Thr Met
 530 535 540
 Gly Gly Ala Asp Gln Leu Ala Lys Asp Val Gly Ser Arg Asn Val Ala
 545 550 555 560
 Ser Trp Asn Asp Pro Leu Asp Ala Leu Val Leu Gly Val His Gln Val
 565 570 575
 Gly Leu Ser Gly Trp Lys Gln Glu Glu Cys Leu Ala Ile Gly Asn Glu
 580 585 590
 Leu Leu Ala Trp Arg Glu Arg Asp Leu Leu Glu Lys Glu Gly Glu Glu
 595 600 605
 Asp Gly Lys Thr Ile Trp Ala Met Arg Leu Lys Ala Thr Leu Asp Arg
 610 615 620
 Ala Arg Arg Leu Thr Ala Glu Tyr Ser Asp Leu Leu Leu Gln Ile Phe
 625 630 635 640

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Pro Pro Asn Val Glu Ile Leu Gly Lys Ala Leu Gly Ile Pro Glu Asn
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 Ser Val Lys Thr Tyr Thr Glu Ala Glu Ile Arg Ala Gly Ile Ile Phe
 660 665 670
 Gln Ile Ser Lys Leu Cys Thr Val Leu Leu Lys Ala Val Arg Asn Ser
 675 680 685
 Leu Gly Ser Glu Gly Trp Asp Val Val Val Pro Gly Ser Thr Ser Gly
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 Thr Leu Val Gln Val Glu Ser Ile Val Pro Gly Ser Leu Pro Ala Thr
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 Ser Gly Gly Pro Ile Ile Leu Leu Val Asn Lys Ala Asp Gly Asp Glu
 725 730 735
 Glu Val Ser Ala Ala Asn Gly Asn Ile Ala Gly Val Met Leu Leu Gln
 740 745 750
 Glu Leu Pro His Leu Ser His Leu Gly Val Arg Ala Arg Gln Glu Lys
 755 760 765
 Ile Val Phe Val Thr Cys Asp Asp Asp Asp Lys Val Ala Asp Ile Arg
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 785 790 795 800
 Asn Leu Ile Leu Ser Thr Glu Gly Arg Ser Arg Thr Ser Lys Ser Ser
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 Ala Thr Lys Lys Thr Asp Lys Asn Ser Leu Ser Lys Lys Lys Thr Asp
 820 825 830
 Lys Lys Ser Leu Ser Ile Asp Asp Glu Glu Ser Lys Pro Gly Ser Ser
 835 840 845
 Ser Ser Asn Ser Leu Leu Tyr Ser Ser Lys Asp Ile Pro Ser Gly Gly
 850 855 860
 Ile Ile Ala Leu Ala Asp Ala Asp Val Pro Thr Ser Gly Ser Lys Ser
 865 870 875 880
 Ala Ala Cys Gly Leu Leu Ala Ser Leu Ala Glu Ala Ser Ser Lys Val
 885 890 895
 His Ser Glu His Gly Val Pro Ala Ser Phe Lys Val Pro Thr Gly Val
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Val Ile Pro Phe Gly Ser Met Glu Leu Ala Leu Lys Gln Asn Asn Ser
 915 920 925
 Glu Glu Lys Phe Ala Ser Leu Leu Glu Lys Leu Glu Thr Ala Arg Pro
 930 935 940
 Glu Gly Gly Glu Leu Asp Asp Ile Cys Asp Gln Ile His Glu Val Met
 945 950 955 960
 Lys Thr Leu Gln Val Pro Lys Glu Thr Ile Asn Ser Ile Ser Lys Ala
 965 970 975
 Phe Leu Lys Asp Ala Arg Leu Ile Val Arg Ser Ser Ala Asn Val Glu
 980 985 990
 Asp Leu Ala Gly Met Ser Ala Ala Gly Leu Tyr Glu Ser Ile Pro Asn
 995 1000 1005
 Val Ser Pro Ser Asp Pro Leu Val Phe Ser Asp Ser Val Cys Gln
 1010 1015 1020
 Val Trp Ala Ser Leu Tyr Thr Arg Arg Ala Val Leu Ser Arg Arg
 1025 1030 1035
 Ala Ala Gly Val Ser Gln Arg Glu Ala Ser Met Ala Val Leu Val
 1040 1045 1050
 Gln Glu Met Leu Ser Pro Asp Leu Ser Phe Val Leu His Thr Val
 1055 1060 1065
 Ser Pro Ala Asp Pro Asp Ser Asn Leu Val Glu Ala Glu Ile Ala
 1070 1075 1080
 Pro Gly Leu Gly Glu Thr Leu Ala Ser Gly Thr Arg Gly Thr Pro
 1085 1090 1095
 Trp Arg Leu Ala Ser Gly Lys Leu Asp Gly Ile Val Gln Thr Leu
 1100 1105 1110
 Ala Phe Ala Asn Phe Ser Glu Glu Leu Leu Val Ser Gly Thr Gly
 1115 1120 1125
 Pro Ala Asp Gly Lys Tyr Val Arg Leu Thr Val Asp Tyr Ser Lys
 1130 1135 1140
 Lys Arg Leu Thr Val Asp Ser Val Phe Arg Gln Gln Leu Gly Gln
 1145 1150 1155
 Arg Leu Gly Ser Val Gly Phe Phe Leu Glu Arg Asn Phe Gly Cys
 1160 1165 1170

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Ala Gln Asp Val Glu Gly Cys Leu Val Gly Glu Asp Val Tyr Ile
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Val Gln Ser Arg Pro Gln Pro Leu
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<212> DNA

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 Gly Gly Arg Pro Arg Arg Gly Leu Val Leu Pro Pro Pro Gly Val Gly
 15 20 25

gcg ggt gtg ctg ctc cgc cgg gga gcg atg gcg ctc cct ggg cgg cgc 147
 Ala Gly Val Leu Leu Arg Arg Gly Ala Met Ala Leu Pro Gly Arg Arg
 30 35 40 45

ggc ttc gcg tgc cgc ggg aga tcc gcg gcc tcg gcg gca gag aga aca 195
 Gly Phe Ala Cys Arg Gly Arg Ser Ala Ala Ser Ala Ala Glu Arg Thr
 50 55 60

aag gag aaa aag aga aga gat tct tca aag cag cca ttg gtg cat ctc 243
 Lys Glu Lys Lys Arg Arg Asp Ser Ser Lys Gln Pro Leu Val His Leu
 65 70 75

cag gtt tgt cta gag cac cag gtt aag ttt ggt gag cat gta ggc att 291
 Gln Val Cys Leu Glu His Gln Val Lys Phe Gly Glu His Val Gly Ile
 80 85 90

atc ggt tcc aca aag gag ctt ggt tca tgg gag gag cag gtt gaa ctg 339
 Ile Gly Ser Thr Lys Glu Leu Gly Ser Trp Glu Glu Gln Val Glu Leu
 95 100 105

gaa tgg act aca aat ggt tgg gtc tgc cag ctt aag ctc cct gga gaa 387
 Glu Trp Thr Thr Asn Gly Trp Val Cys Gln Leu Lys Leu Pro Gly Glu
 110 115 120 125

aca ctt gtg gag ttt aaa ttt gtt ata ttt ttg gtg gga gga aaa gat 435
 Thr Leu Val Glu Phe Lys Phe Val Ile Phe Leu Val Gly Gly Lys Asp
 130 135 140

aaa ata tgg gaa gat ggt aat aac cgt gtt gtt gag ctg ccg aag gat 483

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Lys	Ile	Trp	Glu 145	Asp	Gly	Asn	Asn	Arg 150	Val	Val	Glu	Leu	Pro 155	Lys	Asp	
ggt Gly	aag Lys	ttt Phe 160	gat Asp	ata Ile	gta Val	tgc Cys	cac His 165	tgg Trp	aat Asn	aga Arg	aca Thr	gaa Glu 170	gag Glu	cca Pro	tta Leu	531
gaa Glu 175	ctt Leu	tta Leu	gga Gly	aca Thr	cca Pro	aag Lys 180	ttt Phe	gag Glu	ttg Leu	gtc Val	gga Gly 185	gaa Glu	gct Ala	gaa Glu	aag Lys	579
aat Asn 190	act Thr	ggc Gly	gag Glu	gat Asp	gct Ala 195	tca Ser	gca Ala	tct Ser	gta Val	act Thr 200	ttt Phe	gca Ala	cct Pro	gaa Glu	aaa Lys 205	627
gtt Val	caa Gln	gat Asp	att Ile	tca Ser 210	gtt Val	gtt Val	gag Glu	aat Asn	ggt Gly 215	gat Asp	cca Pro	gca Ala	cca Pro	gag Glu 220	gcc Ala	675
gag Glu	tca Ser	agc Ser	aaa Lys 225	ttt Phe	ggt Gly	ggg Gly	caa Gln	tgg Trp 230	caa Gln	gga Gly	agt Ser	aaa Lys	act Thr 235	gtt Val	ttc Phe	723
atg Met	aga Arg	tca Ser 240	aat Asn	gag Glu	cat His	ctg Leu	aat Asn 245	aag Lys	gag Glu	gct Ala	gat Asp	agg Arg 250	atg Met	tgg Trp	gat Asp	771
aca Thr 255	act Thr	ggg Gly	ctt Leu	gat Asp	gga Gly	ata Ile 260	gca Ala	ctg Leu	aaa Lys	ctg Leu	gtg Val 265	gag Glu	ggc Gly	gat Asp	aaa Lys	819
gca Ala 270	tcc Ser	agg Arg	aac Asn	tgg Trp	tgg Trp 275	cgg Arg	aag Lys	tta Leu	gag Glu	gtt Val 280	gtt Val	cgc Arg	ggg Gly	ata Ile	ttg Leu 285	867
tca Ser	gaa Glu	tct Ser	ttt Phe	gat Asp 290	gac Asp	cag Gln	agt Ser	cgt Arg	ctg Leu 295	ggg Gly	gcc Ala	ctt Leu	gta Val	tac Tyr 300	tca Ser	915
gct Ala	att Ile	tat Tyr	ctg Leu 305	aag Lys	tgg Trp	att Ile	tat Tyr	aca Thr 310	ggt Gly	cag Gln	ata Ile	tcg Ser	tgc Cys 315	ttt Phe	gaa Glu	963
gat Asp	ggt Gly	ggc Gly 320	cac His	cat His	cgg Arg	cct Pro	aac Asn 325	aaa Lys	cat His	gct Ala	gag Glu	ata Ile 330	tcg Ser	agg Arg	caa Gln	1011
ata Ile	ttc Phe 335	cgt Arg	gaa Glu	ctt Leu	gaa Glu	atg Met 340	atg Met	tat Tyr	tat Tyr	ggg Gly	aaa Lys 345	acc Thr	aca Thr	tca Ser	gcc Ala	1059
aag Lys 350	gat Asp	gtt Val	ctc Leu	gtg Val	att Ile 355	cgc Arg	aaa Lys	att Ile	cat His	ccc Pro 360	ttt Phe	tta Leu	cct Pro	tca Ser	ttt Phe 365	1107
aag Lys	tca Ser	gag Glu	ttt Phe	aca Thr 370	gcc Ala	tct Ser	gtc Val	cct Pro	cta Leu 375	aca Thr	cga Arg	att Ile	cgt Arg	gat Asp 380	att Ile	1155
gct Ala	cac His	cgg Arg	aat Asn 385	gac Asp	atc Ile	cca Pro	cat His	gat Asp 390	ctc Leu	aag Lys	caa Gln	gaa Glu	atc Ile 395	aag Lys	cat His	1203
act Thr	ata Ile	caa Gln 400	aac Asn	aaa Lys	ctt Leu	cat His	cgt Arg 405	aat Asn	gct Ala	gga Gly	cct Pro	gag Glu 410	gat Asp	ctt Leu	att Ile	1251
gct	aca	gaa	gtc	atg	ctt	gct	agg	att	act	aag	acc	cct	gga	gaa	tac	1299

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Ala 415	Thr	Glu	Val	Met	Leu	Ala 420	Arg	Ile	Thr	Lys	Thr 425	Pro	Gly	Glu	Tyr	
agt Ser 430	gaa Glu	aca Thr	ttt Phe	gtt Val	gaa Glu 435	caa Gln	ttc Phe	acg Thr	ata Ile	ttt Phe 440	tat Tyr	agc Ser	gaa Glu	cta Leu	aaa Lys 445	1347
gat Asp	ttc Phe	ttc Phe	aat Asn	gct Ala 450	ggc Gly	agc Ser	cta Leu	ttt Phe	gag Glu 455	caa Gln	ctg Leu	gag Glu	tcc Ser	atc Ile 460	aag Lys	1395
gaa Glu	tct Ser	ctg Leu	aac Asn 465	gag Glu	tca Ser	ggc Gly	tta Leu	gaa Glu 470	gtt Val	ctc Leu	tca Ser	tcc Ser	ttt Phe 475	gtg Val	gaa Glu	1443
acc Thr	aaa Lys	agg Arg 480	agt Ser	ttg Leu	gac Asp	caa Gln	gtg Val 485	gat Asp	cat His	gca Ala	gaa Glu	gat Asp 490	ttg Leu	gat Asp	aaa Lys	1491
aat Asn 495	gat Asp	acc Thr	att Ile	caa Gln	att Ile	ttg Leu 500	atg Met	act Thr	acc Thr	ttg Leu 505	caa Gln	tca Ser	tta Leu	tct Ser	tct Ser	1539
cta Leu 510	aga Arg	tcg Ser	gtt Val	cta Leu	atg Met 515	aag Lys	ggc Gly	ctt Leu	gaa Glu	agt Ser 520	ggc Gly	ctt Leu	aga Arg	aat Asn	gat Asp 525	1587
gcg Ala	cct Pro	gat Asp	aat Asn	gct Ala 530	ata Ile	gca Ala	atg Met	cga Arg	caa Gln 535	aag Lys	tgg Trp	cgc Arg	ctt Leu	tgt Cys 540	gaa Glu	1635
att Ile	agt Ser	ctt Leu	gag Glu 545	gat Asp	tat Tyr	tca Ser	ttt Phe	gtt Val 550	ctg Leu	tta Leu	agc Ser	aga Arg	ttc Phe 555	atc Ile	aat Asn	1683
act Thr	ctt Leu	gaa Glu 560	gcc Ala	tta Leu	ggc Gly	gga Gly	tca Ser 565	gct Ala	tca Ser	ctt Leu	gca Ala	aag Lys 570	gat Asp	gta Val	gct Ala	1731
aga Arg 575	aat Asn	act Thr	act Thr	cta Leu	tgg Trp	gat Asp 580	act Thr	act Thr	ctt Leu	gat Asp	gcc Ala 585	ctt Leu	gtc Val	att Ile	ggc Gly	1779
atc Ile 590	aat Asn	caa Gln	gtt Val	agc Ser	ttt Phe 595	tca Ser	ggc Gly	tgg Trp	aaa Lys	aca Thr 600	gat Asp	gaa Glu	tgt Cys	att Ile	gcc Ala 605	1827
ata Ile	ggg Gly	aat Asn	gag Glu	att Ile 610	ctt Leu	tcc Ser	tgg Trp	aag Lys	caa Gln 615	aaa Lys	ggc Gly	cta Leu	tct Ser	gaa Glu 620	agt Ser	1875
gaa Glu	ggc Gly	tgt Cys	gaa Glu 625	gat Asp	ggg Gly	aaa Lys	tat Tyr	att Ile 630	tgg Trp	tca Ser	cta Leu	aga Arg	ctt Leu 635	aaa Lys	gct Ala	1923
aca Thr	ctg Leu	gac Asp 640	aga Arg	gca Ala	cgg Arg	aga Arg	tta Leu 645	acg Thr	gaa Glu	gag Glu	tac Tyr	tct Ser 650	gaa Glu	gca Ala	ctt Leu	1971
ctt Leu	tct Ser 655	ata Ile	ttc Phe	cct Pro	gaa Glu	aaa Lys 660	gta Val	atg Met	gtt Val	att Ile	ggg Gly 665	aaa Lys	gcc Ala	ctt Leu	gga Gly	2019
ata Ile 670	cca Pro	gat Asp	aac Asn	agt Ser	gtg Val 675	aga Arg	act Thr	tac Tyr	aca Thr	gag Glu 680	gca Ala	gaa Glu	att Ile	cgt Arg	gct Ala 685	2067
ggc	att	gtt	ttt	cag	gta	tct	aaa	cta	tgc	aca	gta	ctt	cag	aaa	gca	2115

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Gly	Ile	Val	Phe	Gln	Val	Ser	Lys	Leu	Cys	Thr	Val	Leu	Gln	Lys	Ala
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att	cga	gaa	gta	ctt	gga	tca	act	ggc	tgg	gat	gtt	ctt	gtt	cct	gga
Ile	Arg	Glu	Val	Leu	Gly	Ser	Thr	Gly	Trp	Asp	Val	Leu	Val	Pro	Gly
			705					710					715		
gtg	gcc	cat	gga	act	ctg	atg	cgg	gtg	gaa	aga	att	ctt	cct	gga	tca
Val	Ala	His	Gly	Thr	Leu	Met	Arg	Val	Glu	Arg	Ile	Leu	Pro	Gly	Ser
			720				725					730			
tta	cct	tca	tct	gtc	aaa	gaa	cct	gtg	gtt	cta	att	gta	gat	aag	gct
Leu	Pro	Ser	Ser	Val	Lys	Glu	Pro	Val	Val	Leu	Ile	Val	Asp	Lys	Ala
						740					745				
gat	gga	gat	gaa	gag	gtc	aaa	gct	gct	ggg	gat	aat	ata	gtt	ggc	gtt
Asp	Gly	Asp	Glu	Glu	Val	Lys	Ala	Ala	Gly	Asp	Asn	Ile	Val	Gly	Val
					755					760					765
att	ctt	ctt	cag	gaa	cta	cct	cac	ctt	tca	cat	ctt	ggc	gtt	aga	gct
Ile	Leu	Leu	Gln	Glu	Leu	Pro	His	Leu	Ser	His	Leu	Gly	Val	Arg	Ala
				770					775					780	
cgt	caa	gag	aat	gtt	gta	ttt	gta	act	tgt	gaa	tat	gat	gac	aca	gtt
Arg	Gln	Glu	Asn	Val	Val	Phe	Val	Thr	Cys	Glu	Tyr	Asp	Asp	Thr	Val
			785					790					795		
aca	gat	gtg	tat	ttg	ctt	gag	gga	aaa	tat	atc	aga	tta	gaa	gca	tca
Thr	Asp	Val	Tyr	Leu	Leu	Glu	Gly	Lys	Tyr	Ile	Arg	Leu	Glu	Ala	Ser
			800				805					810			
tcc	atc	aat	gtc	aat	ctc	tca	ata	gtt	tca	gaa	aaa	aat	gac	aat	gct
Ser	Ile	Asn	Val	Asn	Leu	Ser	Ile	Val	Ser	Glu	Lys	Asn	Asp	Asn	Ala
			815			820					825				
gtc	tct	aca	gaa	cca	aat	agt	aca	ggg	aat	cca	ttt	caa	cag	aaa	ctc
Val	Ser	Thr	Glu	Pro	Asn	Ser	Thr	Gly	Asn	Pro	Phe	Gln	Gln	Lys	Leu
					835					840					845
caa	aat	gaa	ttc	tct	cta	cca	tcg	gat	atc	gag	atg	cca	ctg	caa	atg
Gln	Asn	Glu	Phe	Ser	Leu	Pro	Ser	Asp	Ile	Glu	Met	Pro	Leu	Gln	Met
				850					855					860	
tct	aag	caa	aaa	agc	aaa	tca	gga	gtg	aat	ggc	agt	ttt	gct	gct	ctt
Ser	Lys	Gln	Lys	Ser	Lys	Ser	Gly	Val	Asn	Gly	Ser	Phe	Ala	Ala	Leu
			865					870					875		
gag	ctt	tca	gaa	gct	tca	gtg	gaa	tca	gct	ggc	gca	aaa	gct	gct	gca
Glu	Leu	Ser	Glu	Ala	Ser	Val	Glu	Ser	Ala	Gly	Ala	Lys	Ala	Ala	Ala
			880				885					890			
tgc	aga	act	ctt	tct	gtt	ctt	gct	tca	ttg	tct	aat	aaa	gtc	tat	agt
Cys	Arg	Thr	Leu	Ser	Val	Leu	Ala	Ser	Leu	Ser	Asn	Lys	Val	Tyr	Ser
						900					905				
gat	caa	gga	gtt	cca	gca	gcc	ttt	aga	gtc	cct	tct	ggc	gct	gtg	ata
Asp	Gln	Gly	Val	Pro	Ala	Ala	Phe	Arg	Val	Pro	Ser	Gly	Ala	Val	Ile
					915					920					925
cca	ttt	gga	tca	atg	gag	gat	gcg	ctc	aag	aaa	agt	gga	tca	ctg	gaa
Pro	Phe	Gly	Ser	Met	Glu	Asp	Ala	Leu	Lys	Lys	Ser	Gly	Ser	Leu	Glu
				930					935					940	
tcc	ttt	aca	agc	ctt	cta	gaa	aag	att	gaa	aca	gcc	aaa	gtc	gaa	aat
Ser	Phe	Thr	Ser	Leu	Leu	Glu	Lys	Ile	Glu	Thr	Ala	Lys	Val	Glu	Asn
			945					950					955		
ggc	gaa	gtt	gat	agc	ctg	gcg	ttg	gag	cta	caa	gca	ata	att	tca	cat

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Gly	Glu	Val	Asp	Ser	Leu	Ala	Leu	Glu	Leu	Gln	Ala	Ile	Ile	Ser	His		
		960					965					970					
ctt	tcc	cca	ccg	gag	gag	act	att	ata	ttt	ctc	aaa	aga	atc	ttc	cca		2979
Leu	Ser	Pro	Pro	Glu	Glu	Thr	Ile	Ile	Phe	Leu	Lys	Arg	Ile	Phe	Pro		
		975				980					985						
cag	gat	gtc	cgg	ttg	att	gtt	aga	tct	agt	gct	aat	gtg	gag	gat	ttg		3027
Gln	Asp	Val	Arg	Leu	Ile	Val	Arg	Ser	Ser	Ala	Asn	Val	Glu	Asp	Leu		
990					995					1000					1005		
gct	ggt	atg	tca	gct	gct	ggt	ctc	tat	gat	tca	att	ccc	aat	gtc			3072
Ala	Gly	Met	Ser	Ala	Ala	Gly	Leu	Tyr	Asp	Ser	Ile	Pro	Asn	Val			
				1010					1015					1020			
agt	ctc	atg	gac	cca	tgt	gcc	ttt	gga	gct	gcg	gtt	ggg	aag	gtt			3117
Ser	Leu	Met	Asp	Pro	Cys	Ala	Phe	Gly	Ala	Ala	Val	Gly	Lys	Val			
				1025					1030					1035			
tgg	gct	tct	tta	tac	aca	agg	aga	gcc	atc	cta	agc	cgt	cga	gcc			3162
Trp	Ala	Ser	Leu	Tyr	Thr	Arg	Arg	Ala	Ile	Leu	Ser	Arg	Arg	Ala			
				1040					1045					1050			
gct	ggt	gtt	tat	cag	aga	gac	gcg	aca	atg	gct	gtt	ctt	gtc	caa			3207
Ala	Gly	Val	Tyr	Gln	Arg	Asp	Ala	Thr	Met	Ala	Val	Leu	Val	Gln			
				1055					1060					1065			
gaa	ata	ctg	cag	cca	gat	ctc	tcc	ttc	gtg	ctt	cat	act	gtt	tgc			3252
Glu	Ile	Leu	Gln	Pro	Asp	Leu	Ser	Phe	Val	Leu	His	Thr	Val	Cys			
				1070					1075					1080			
ccc	gct	gac	cat	gac	ccc	aag	gtt	gtc	cag	gct	gag	gtc	gcc	cct			3297
Pro	Ala	Asp	His	Asp	Pro	Lys	Val	Val	Gln	Ala	Glu	Val	Ala	Pro			
				1085					1090					1095			
ggg	ctg	ggt	gaa	acg	ctt	gct	tca	gga	acc	cgt	ggc	acc	ccg	tgg			3342
Gly	Leu	Gly	Glu	Thr	Leu	Ala	Ser	Gly	Thr	Arg	Gly	Thr	Pro	Trp			
				1100					1105					1110			
agg	ctg	tca	tgt	aac	aaa	ttc	gat	gga	aaa	gtt	gcc	act	ctt	gcc			3387
Arg	Leu	Ser	Cys	Asn	Lys	Phe	Asp	Gly	Lys	Val	Ala	Thr	Leu	Ala			
				1115					1120					1125			
ttt	tca	aat	ttc	agt	gag	gag	atg	gtg	gtg	cac	aac	tct	ggt	cct			3432
Phe	Ser	Asn	Phe	Ser	Glu	Glu	Met	Val	Val	His	Asn	Ser	Gly	Pro			
				1130					1135					1140			
gcc	aat	gga	gaa	gta	att	cgt	ctt	act	gtt	gat	tac	agc	aag	aag			3477
Ala	Asn	Gly	Glu	Val	Ile	Arg	Leu	Thr	Val	Asp	Tyr	Ser	Lys	Lys			
				1145					1150					1155			
cca	ttg	tcg	gtt	gat	aca	acc	ttt	agg	aag	cag	ttt	ggt	cag	cga			3522
Pro	Leu	Ser	Val	Asp	Thr	Thr	Phe	Arg	Lys	Gln	Phe	Gly	Gln	Arg			
				1160					1165					1170			
ctg	gct	gcg	att	ggc	cag	tat	ctg	gag	cag	aag	ttc	ggg	agt	gca			3567
Leu	Ala	Ala	Ile	Gly	Gln	Tyr	Leu	Glu	Gln	Lys	Phe	Gly	Ser	Ala			
				1175					1180					1185			
cag	gat	gtg	gaa	ggt	tgc	ctg	gtt	ggg	aaa	gat	att	ttt	ata	gtg			3612
Gln	Asp	Val	Glu	Gly	Cys	Leu	Val	Gly	Lys	Asp	Ile	Phe	Ile	Val			
				1190					1195					1200			
caa	agc	agg	cca	cag	cca	tag	aagccgaatt	c									3644
Gln	Ser	Arg	Pro	Gln	Pro												
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 Leu Leu Arg Arg Gly Ala Met Ala Leu Pro Gly Arg Arg Gly Phe Ala
 35 40 45
 Cys Arg Gly Arg Ser Ala Ala Ser Ala Ala Glu Arg Thr Lys Glu Lys
 50 55 60
 Lys Arg Arg Asp Ser Ser Lys Gln Pro Leu Val His Leu Gln Val Cys
 65 70 75 80
 Leu Glu His Gln Val Lys Phe Gly Glu His Val Gly Ile Ile Gly Ser
 85 90 95
 Thr Lys Glu Leu Gly Ser Trp Glu Glu Gln Val Glu Leu Glu Trp Thr
 100 105 110
 Thr Asn Gly Trp Val Cys Gln Leu Lys Leu Pro Gly Glu Thr Leu Val
 115 120 125
 Glu Phe Lys Phe Val Ile Phe Leu Val Gly Gly Lys Asp Lys Ile Trp
 130 135 140
 Glu Asp Gly Asn Asn Arg Val Val Glu Leu Pro Lys Asp Gly Lys Phe
 145 150 155 160
 Asp Ile Val Cys His Trp Asn Arg Thr Glu Glu Pro Leu Glu Leu Leu
 165 170 175
 Gly Thr Pro Lys Phe Glu Leu Val Gly Glu Ala Glu Lys Asn Thr Gly
 180 185 190
 Glu Asp Ala Ser Ala Ser Val Thr Phe Ala Pro Glu Lys Val Gln Asp
 195 200 205
 Ile Ser Val Val Glu Asn Gly Asp Pro Ala Pro Glu Ala Glu Ser Ser
 210 215 220

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Lys Phe Gly Gly Gln Trp Gln Gly Ser Lys Thr Val Phe Met Arg Ser
 225 230 235 240

Asn Glu His Leu Asn Lys Glu Ala Asp Arg Met Trp Asp Thr Thr Gly
 245 250 255

Leu Asp Gly Ile Ala Leu Lys Leu Val Glu Gly Asp Lys Ala Ser Arg
 260 265 270

Asn Trp Trp Arg Lys Leu Glu Val Val Arg Gly Ile Leu Ser Glu Ser
 275 280 285

Phe Asp Asp Gln Ser Arg Leu Gly Ala Leu Val Tyr Ser Ala Ile Tyr
 290 295 300

Leu Lys Trp Ile Tyr Thr Gly Gln Ile Ser Cys Phe Glu Asp Gly Gly
 305 310 315 320

His His Arg Pro Asn Lys His Ala Glu Ile Ser Arg Gln Ile Phe Arg
 325 330 335

Glu Leu Glu Met Met Tyr Tyr Gly Lys Thr Thr Ser Ala Lys Asp Val
 340 345 350

Leu Val Ile Arg Lys Ile His Pro Phe Leu Pro Ser Phe Lys Ser Glu
 355 360 365

Phe Thr Ala Ser Val Pro Leu Thr Arg Ile Arg Asp Ile Ala His Arg
 370 375 380

Asn Asp Ile Pro His Asp Leu Lys Gln Glu Ile Lys His Thr Ile Gln
 385 390 395 400

Asn Lys Leu His Arg Asn Ala Gly Pro Glu Asp Leu Ile Ala Thr Glu
 405 410 415

Val Met Leu Ala Arg Ile Thr Lys Thr Pro Gly Glu Tyr Ser Glu Thr
 420 425 430

Phe Val Glu Gln Phe Thr Ile Phe Tyr Ser Glu Leu Lys Asp Phe Phe
 435 440 445

Asn Ala Gly Ser Leu Phe Glu Gln Leu Glu Ser Ile Lys Glu Ser Leu
 450 455 460

Asn Glu Ser Gly Leu Glu Val Leu Ser Ser Phe Val Glu Thr Lys Arg
 465 470 475 480

Ser Leu Asp Gln Val Asp His Ala Glu Asp Leu Asp Lys Asn Asp Thr
 485 490 495

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 Ile Gln Ile Leu Met Thr Thr Leu Gln Ser Leu Ser Ser Leu Arg Ser
 500 505 510

Val Leu Met Lys Gly Leu Glu Ser Gly Leu Arg Asn Asp Ala Pro Asp
 515 520 525

Asn Ala Ile Ala Met Arg Gln Lys Trp Arg Leu Cys Glu Ile Ser Leu
 530 535 540

Glu Asp Tyr Ser Phe Val Leu Leu Ser Arg Phe Ile Asn Thr Leu Glu
 545 550 555 560

Ala Leu Gly Gly Ser Ala Ser Leu Ala Lys Asp Val Ala Arg Asn Thr
 565 570 575

Thr Leu Trp Asp Thr Thr Leu Asp Ala Leu Val Ile Gly Ile Asn Gln
 580 585 590

Val Ser Phe Ser Gly Trp Lys Thr Asp Glu Cys Ile Ala Ile Gly Asn
 595 600 605

Glu Ile Leu Ser Trp Lys Gln Lys Gly Leu Ser Glu Ser Glu Gly Cys
 610 615 620

Glu Asp Gly Lys Tyr Ile Trp Ser Leu Arg Leu Lys Ala Thr Leu Asp
 625 630 635 640

Arg Ala Arg Arg Leu Thr Glu Glu Tyr Ser Glu Ala Leu Leu Ser Ile
 645 650 655

Phe Pro Glu Lys Val Met Val Ile Gly Lys Ala Leu Gly Ile Pro Asp
 660 665 670

Asn Ser Val Arg Thr Tyr Thr Glu Ala Glu Ile Arg Ala Gly Ile Val
 675 680 685

Phe Gln Val Ser Lys Leu Cys Thr Val Leu Gln Lys Ala Ile Arg Glu
 690 695 700

Val Leu Gly Ser Thr Gly Trp Asp Val Leu Val Pro Gly Val Ala His
 705 710 715 720

Gly Thr Leu Met Arg Val Glu Arg Ile Leu Pro Gly Ser Leu Pro Ser
 725 730 735

Ser Val Lys Glu Pro Val Val Leu Ile Val Asp Lys Ala Asp Gly Asp
 740 745 750

Glu Glu Val Lys Ala Ala Gly Asp Asn Ile Val Gly Val Ile Leu Leu
 755 760 765

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Gln Glu Leu Pro His Leu Ser His Leu Gly Val Arg Ala Arg Gln Glu
770 775 780

Asn Val Val Phe Val Thr Cys Glu Tyr Asp Asp Thr Val Thr Asp Val
785 790 795 800

Tyr Leu Leu Glu Gly Lys Tyr Ile Arg Leu Glu Ala Ser Ser Ile Asn
805 810 815

Val Asn Leu Ser Ile Val Ser Glu Lys Asn Asp Asn Ala Val Ser Thr
820 825 830

Glu Pro Asn Ser Thr Gly Asn Pro Phe Gln Gln Lys Leu Gln Asn Glu
835 840 845

Phe Ser Leu Pro Ser Asp Ile Glu Met Pro Leu Gln Met Ser Lys Gln
850 855 860

Lys Ser Lys Ser Gly Val Asn Gly Ser Phe Ala Ala Leu Glu Leu Ser
865 870 875 880

Glu Ala Ser Val Glu Ser Ala Gly Ala Lys Ala Ala Ala Cys Arg Thr
885 890 895

Leu Ser Val Leu Ala Ser Leu Ser Asn Lys Val Tyr Ser Asp Gln Gly
900 905 910

Val Pro Ala Ala Phe Arg Val Pro Ser Gly Ala Val Ile Pro Phe Gly
915 920 925

Ser Met Glu Asp Ala Leu Lys Lys Ser Gly Ser Leu Glu Ser Phe Thr
930 935 940

Ser Leu Leu Glu Lys Ile Glu Thr Ala Lys Val Glu Asn Gly Glu Val
945 950 955 960

Asp Ser Leu Ala Leu Glu Leu Gln Ala Ile Ile Ser His Leu Ser Pro
965 970 975

Pro Glu Glu Thr Ile Ile Phe Leu Lys Arg Ile Phe Pro Gln Asp Val
980 985 990

Arg Leu Ile Val Arg Ser Ser Ala Asn Val Glu Asp Leu Ala Gly Met
995 1000 1005

Ser Ala Ala Gly Leu Tyr Asp Ser Ile Pro Asn Val Ser Leu Met
1010 1015 1020

Asp Pro Cys Ala Phe Gly Ala Ala Val Gly Lys Val Trp Ala Ser
1025 1030 1035

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Leu Tyr Thr Arg Arg Ala Ile Leu Ser Arg Arg Ala Ala Gly Val
 1040 1045 1050

Tyr Gln Arg Asp Ala Thr Met Ala Val Leu Val Gln Glu Ile Leu
 1055 1060 1065

Gln Pro Asp Leu Ser Phe Val Leu His Thr Val Cys Pro Ala Asp
 1070 1075 1080

His Asp Pro Lys Val Val Gln Ala Glu Val Ala Pro Gly Leu Gly
 1085 1090 1095

Glu Thr Leu Ala Ser Gly Thr Arg Gly Thr Pro Trp Arg Leu Ser
 1100 1105 1110

Cys Asn Lys Phe Asp Gly Lys Val Ala Thr Leu Ala Phe Ser Asn
 1115 1120 1125

Phe Ser Glu Glu Met Val Val His Asn Ser Gly Pro Ala Asn Gly
 1130 1135 1140

Glu Val Ile Arg Leu Thr Val Asp Tyr Ser Lys Lys Pro Leu Ser
 1145 1150 1155

Val Asp Thr Thr Phe Arg Lys Gln Phe Gly Gln Arg Leu Ala Ala
 1160 1165 1170

Ile Gly Gln Tyr Leu Glu Gln Lys Phe Gly Ser Ala Gln Asp Val
 1175 1180 1185

Glu Gly Cys Leu Val Gly Lys Asp Ile Phe Ile Val Gln Ser Arg
 1190 1195 1200

Pro Gln Pro
 1205

<210> 5

<211> 12

<212> PRT

<213> Arabidopsis thaliana, Oryza sativa

<400> 5

Leu Pro His Leu Ser His Leu Gly Val Arg Ala Arg
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